Forest Insect & Disease Management

Report No. 79-1-16
May 1979

1979 STATUS OF THE FALL CANKERWORM ON THE CUMBERLAND GAP NATIONAL HISTORICAL PARK

SOUTHEASTERN AREA, STATE & PRIVATE FORESTRY
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COVER PHOTO

Fall Cankerworm eggs magnified 50 X

1979 STATUS OF THE FALL CANKERWORM ON THE CUMBERLAND GAP NATIONAL HISTORICAL PARK

by

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ABSTRACT

Predicted heavy defoliation by the fall cankerworm will be limited to two small areas along the Ridge Trail. The public should be informed of the potential nuisance caused by this insect, if they plan on using this area between mid-May and early June. Parasitism by the egg parasite Telenomus alsophilae is high throughout most of the infestation and will effectively control the outbreak in the future.

INTRODUCTION

Defoliation of hardwoods was first detected on the Cumberland Gap National Historical Park during the spring of 1978. The causal agent was identified as the fall cankerworm, Alsophila pometaria (Harr) by Forest Insect and Disease Management personnel. During the early spring of 1979, a sequential egg mass survey was conducted to determine the extent and severity of this year's infestation.

The insect is a native hardwood defoliator that occurs from southern Canada to northern Georgia and west to Colorado. Elm and apple are preferred hosts, but during outbreak conditions, the fall cankerworm also attacks many other hardwoods, including hickories, red and white oaks, maples, ash, beech, cherry, boxelder and basswood.

In most instances, the fall cankerworm is not regarded as a serious forest pest because outbreaks usually last only 2 to 3 years (Anderson, 1960). Normally, trees defoliated early in the season, refoliate later in the

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summer and sustain only moderate growth loss. However, successive heavy defoliations combined with drought or other environmemtal stress factors can cause dieback or mortality. Trees weakened by repeated defoliation are also more susceptible to damage from secondary pest organisms.

The greatest impact of the fall cankerworm is as a nuisance in forested residential and recreation areas. Losses are immediate in areas where tree cover contributes significantly to the aesthetic and recreational aspect of the forest, and long term where mortality results. Defoliation, the presence of larvae, and frass drop reduce the recreational value of the forest.

BIOLOGY

Fall cankerworm adults begin emerging in late fall, usually following a freeze. The wingless females climb a nearby tree, mate, and normally deposit an average of 150 eggs in compact, single layered clusters on the terminal parts of the branches. With the advent of warm weather, the eggs may be parasitized by an egg parasite Telenomus alsophilae (Vier), which is a major natural control for the fall cankerworm. The eggs hatch in the spring, about the time the leaves start to unfold and the small caterpillars begin to skeletonize the foliage; as the larvae grow, they begin to consume the entire leaf, leaving only the primary veins and midrib. Feeding ends in late May or early June, when the larvae drop to the soil and enter it to pupate. Here they will remain until fall.

METHODS

During the week of April 2, a sequential egg mass survey (Talerico, 1967) was conducted along the Ridge Trail above the Hensley Settlement (Fig. 1). Plots were spaced approximately 500 meters apart. Five 30-inch branch segments were cut from the crown of each sample tree. The abundance or absence of egg masses was used to predict the degree of devoliation expected this spring.

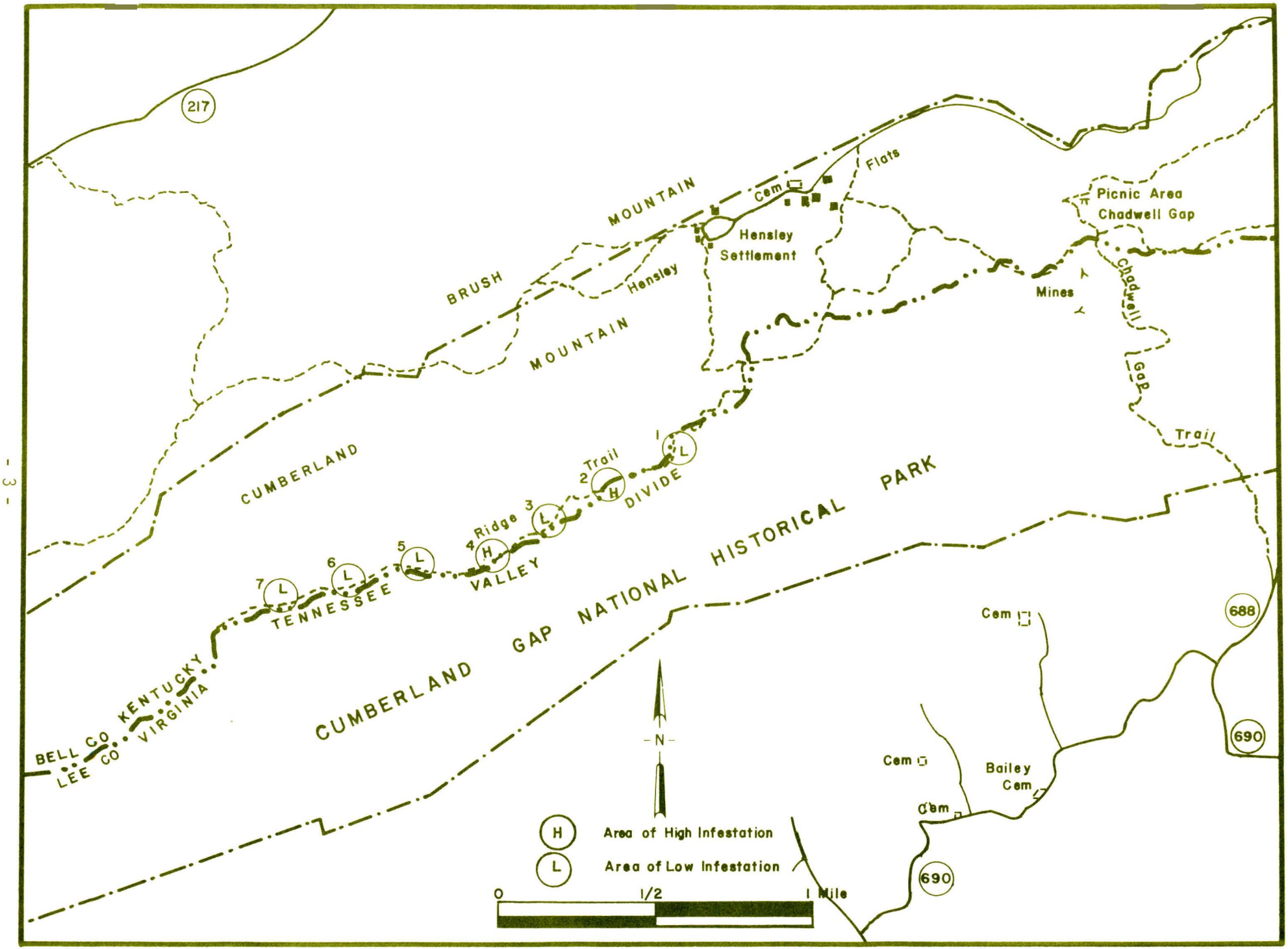

Figure 1. Location of fall cankerworm egg mass survey plots, April 1979.

Egg masses from each plot were brought back to the laboratory and reared at room temperature and 75% relative humidity to determine the percent of parasitism and egg viability. After larvae had hatched, the remaining egg masses were dissected to determine the cause for failure of some of the eggs to hatch. Parasitized eggs contained the developing or adult form of the egg parasite Telenomus alsophilae (Vier). The number of eggs per mass were counted and the percent of sound, non-viable and parasitized eggs for each were calculated. Table 1 shows the results of the egg mass dissections.

RESULTS

Sequential egg mass sampling detected two areas along the Ridge Trail where heavy defoliation is predicted. All other plots predict light fall cankerworm activity.

Dissection of egg masses indicate a high rate of parasitism by Telenomus alsophilae and to a lesser extent, by a species of Trichogrammatidae. Ninety-eight percent of all egg masses were parasitized with many exceeding 80 percent of all the eggs colonized. Parasitism greater than 75 percent is considered effective in reducing outbreaks. Table 1 lists plot predictions, average amount of parasitism per egg mass and the range of parasitism.

Table 1. Summarization of plot defoliation predictions and egg mass parasitism for the spring of 1979.

Plot No.	Predicted Defoliation	Average % Parasitism	Range of % Parasitism
1	Light	64	88-27
2	Heavy	45	88-3
3	Light	41	62-17
4	Heavy	15	50-0
5	Light	91*	91
6	Light	35	67-10
7	Light	48	79-32

* Represented by only one egg mass

RECOMMENDATIONS

1. The high level of parasitism, which occurs throughout the current infestation, indicates a rapidly declining population. It can be predicted that the fall cankerworm population will return to a low level next year.

2. Forest Insect and Disease Management will conduct an aerial survey in early June to delineate any additional areas of defoliation which occurs this spring on the Park.

3. Due to the frequent visitor use of this area, the public should be informed of the potential nuisance caused by fall cankerworm larvae, frass and the resulting defoliation.

Feeding begins in early May and continues through the first week in June. Those trees which were heavily defoliated will begin to refoliate when the insect pupates in June.

REFERENCES

1. Anderson, R. F., 1960. Forest and Shade Tree Entomology. John Wiley & sons, Inc., N. Y. and London 428 pp

2. Talerico, R. L., 1967. An Exploratory Study to Determine the Distribution of Fall Cankerworm Egg Masses on Oak Trees in the Mountains of Virginia. 11 p. unpub.